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SURVEY & CONTROL
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INTERMOUNTAIN STATION
Central Reference File
No. 3,4163-42

# UNITED STATES DEPARTMENT OF AGRICULTURE

## BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project | Date | Author

SUBJECT—

## TITLE

PLAN OF OPERATION
FOR THE
EXPERIMENTAL BARK BEETLE CONTROL PROJECT
IN THE
COEUR D'ALENE NATIONAL FOREST
1941

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December 3, 1940

INDEX No.—

U.S. GOVERNMENT PRINTING OFFICE 8—9742

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# PLAN OF OPERATION FOR THE EXPERIMENTAL BARK BEETLE CONTROL PROJECT IN THE COEUR D'ALENE NATIONAL FOREST 1941

The forest insect survey of the Coeur d'Alene National Forest, conducted during August 1940, indicated a potentially serious infestation of the mountain pine beetle within the white pine stands of the Forks-Cabin and Clay Creek units of the Steamboat drainage. This condition had been previously revealed by the 1939 survey, and although control measures were recommended at that time, funds were not available for their institution. This season's data did not indicate any marked changes in the severity of the infestation; however, the condition was again considered as being sufficiently serious to warrant the institution of control.

As funds could not be made available during the fall of 1940, it was necessary to postpone any further consideration of this project until the spring of 1941. In the event that funds are available it is proposed that instead of employing the usual methods of treatment, which consist of decking and burning or of peeling, the project be used as practical test of the effectiveness and practicability of penetrating sprays. As the name infers, this spray penetrates the bark and destroys the insect broods beneath. Its effectiveness in lodgepole pine has been established, but it is not known if the treatment will be equally satisfactory in white pine.

The following plan of operation for this proposed experimental project outlines a treating organization that is based upon the best

information available, and contains a list of the equipment and materials that will be necessary. As the materials to be used as well as the man-day output are estimates only, it is fully realized that they are subject to question and may be somewhat in error. It is also realized that the suggested plan of crew organization may require changes as the work proceeds.

## SUPERVISION

The treatment of bark beetle infested trees with a penetrating spray is not a "fool proof" method of control, and will require as much or more consideration as other methods now in use. Constant and adequate supervision must be available to maintain a standard of work which will assure the success of the project. If the work is to be properly performed, the crew leader must be present at the treatment of all trees. It is suggested that this leader mark the stump of each tree as being satisfactorily treated, which will fix the responsibility for an improper treatment and insure proper supervision. Too much emphasis can hardly be placed upon the need for adequate and proper supervision.

## SUGGESTED PROJECT ORGANIZATION

### CAMPS

The acreage involved in connection with this project will require a two-camp set up. One of these camps will be located at the mouth of Long Tom Creek, and the other along the East Fork trail in the N. W. ¼ sec. 22. Both these locations are regular camp sites. Each camp will be under the direct supervision of a "work supervisor", who will be responsible for the character of all work performed.

SPOTTING

Although in using this method in lodgepole pine the spotting and treating are combined in one operation, in the execution of this project it is considered advisable for these two phases of the work to be performed separately. This opinion is based upon the following reasons:

1. The transportation of spray materials in white pine stands is going to be difficult, and pack horses loaded with this material could not follow spotting crew as closely as would be required.

2. As the felling and treatment of an infested white pine tree will require some time and as only a limited number of men can be efficiently employed on each tree, there would be considerable lost time on the part of a combined spotting and treating crew.

3. With the spotting being performed ahead of the treaters, the spotters' maps will be available for an efficient planning of the treating operation.

Spotting of infested trees should be started as early in May as weather and snow conditions will permit. If the spotting could be completed before treating is under way, the spotting personnel could be shifted into the treating organization, which would reduce the number of men required for the completion of this operation.

Spotting will start at the Long Tom camp with all five crews working the lower portion of the area. As field conditions permit, the upper camp will be established and the spotting crews moved into the upper portion of the area. This will eliminate the necessity for maintaining two small camps during the period of spotting.

To cover the acreage of the two units involved in this project, five spotting crews will be required for a period of three weeks. Each spotting crew will be composed of a chief spotter, compassman, and four

spotters. There should also be one "spotter checker", as it has been demonstrated that the constant checking of the work of the spotting crews materially increases their efficiency.

The spotting phase of the project will require:

Personnel

| | |
|---|---|
| Chief spotters | 5 |
| Compassmen | 5 |
| Spotters | 20 |
| Spotter checkers | 1 |

Equipment

| | |
|---|---|
| Standard F. S. staff compasses | 6 |
| Jacob staffs | 5 |
| Tally registers | 10 |
| Tatum holders | 6 |
| Spotters axes with belt sheaths | 35 |
| Lumbermen's crayon (boxes) | 3 |
| Marking tags (white or yellow cloth, 4" x 6") | 3,000 |
| Map sheets, Form #878 | 100 |
| Red pencils | 1 doz. |

TREATING

As there have been no previous projects of this character, it has proved to be somewhat difficult to set up what is hoped will be the most efficient treating organization. The most efficient treating organization is considered as being the smallest self-producing unit or organization that can function by itself. Such a unit will reduce the amount of noneffective time spent in walking to and looking for trees marked by the spotters; there will be no lost time on the part of the crew members waiting for trees to be cut and treated, and enough spray can be carried on one pack animal to provide for an average day's treating. A three-man organization, including the laborer assigned to

the transportation of spray, is considered as the most efficient set up for this work. Under some circumstances it may be necessary to add a fourth man to the crews working in heavy infestation.

TRANSPORTATION OF SPRAY IN THE FIELD

Although a number of different containers for the field transportation of the spray have been tried, the most satisfactory results were obtained with 5-gallon "honey cans". These are round, rather heavily constructed cans, with a non-leak, pressure-spring cap. They are carried four to a pack animal in a specially constructed pack box (fig.__), from which they can be readily removed.

SPRAY FORMULA TO BE USED

The formula to be used in connection with this project will be

4 parts Fuel Oil
1 part Orthodichlorobenzene

Some different strength solutions will be tested in an effort to obtain the most economical formula.

TECHNIQUE OF TREATMENT

In addition to the actual technique of applying the spray there are a number of factors to be considered in connection with this method of control.

1. Trees must be felled, limbed, and the infested portion of the bole cut sufficiently to permit rolling. Trees should not be felled along contours, as when lodged against other trees they are difficult to turn.

2. Trees should not be felled and left lying on the ground for any period of time prior to treatment. If the surface of the bark becomes wet from snow or rain, the treatment would be ineffective, as the spray will not penetrate the wet bark.

3. Treating should not be conducted if boles of trees are wet from rain or snow.

4. Trees can not be felled into deep snow, as this dampens the bark and makes the spray ineffective.

5. Trees should be treated the same day as they are felled, and immediately after felling if possible.

6. Trees should be felled north or south when feasible.

As this treatment is only effective where the spray is properly applied, a technique must be employed which will accomplish this objective with a minimum of time and materials, with care being exercised to prevent waste. Thick-barked trees require more spray, and it is often necessary to cover the base of large trees with a second spraying. A second spraying can be applied a minute or two after the first coverage has been made, as the bark absorbs the liquid quite rapidly. Thorough spraying demands that the entire surface of the infested portion of the bole be sprayed until the bark glistens and drops of moisture appear on the bark scales. There is little lateral distribution of the spray beneath the bark, so if an area of a few square inches is missed or improperly sprayed, the insects beneath are not destroyed.

Trees marked for treatment are felled, the infested length of the bole cut off and the limbs removed to facilitate rolling. The treater, using a 30-inch brass rod extension and a fine fan-spray nozzle, walks along the top of the log and sprays the upper arc of its circumference. The width of the strip to be covered, which will vary with the diameter of the log being treated, governs the distance that the nozzle is held from the log. By treating the top of the log only, splashing and wasting of spray is avoided, and the force of gravity apparently

aids penetration. As each top arc is sprayed the log is rolled sufficiently to permit the treatment of another strip. Care must be exercised to prevent the leaving of unsprayed areas of bark between the strips or behind knots and limbs. A watchword for treaters would be "thorough treatment with no waste of materials".

Although the proposed organization is considered as being the most efficient set up for this project, every effort will be made to make any necessary changes which will produce the most efficient treating organization. It is realized that the economical success of this method of treatment rests upon the treating crew man-day output.

In treating the following equipment will be required.

| | |
|---|---|
| Saws, 5½ foot | Axes, 3½#, D.B. |
| Single jacks | Canthooks, 4½' handles |
| Felling wedges | Spray tanks |
| | Pocket compass for foreman |

SERVICE OF SPRAY TRANSPORTATION

The transportation of thousands of gallons of spray into the woods, and to the treating crews as needed, will perhaps prove to be the most difficult task in the use of this method of treatment in white pine. Careful planning will be necessary to make this phase of the project as efficient as possible; however, it should be recognized that its importance warrants adequate transportation facilities.

The spray should be mixed at the time the basic fuel oil is transferred from the tank car to the 50-gallon drums in which the spray is transported to the end of the truck road. Mixing is easily accomplished by placing the required lethal materials in each drum before it is filled with fuel oil. At the end of truck transportation the mixed spray is transferred to the 5-gallon containers and carried by pack animals

to the two camp sites and other designated caches. The spray will be stored at the camp sites and caches in 50-gallon drums. In connection with this service a large percent of the material should be moved into the areas before treating is started. With an adequate reserve of mixed spray in the field the daily pressure of supplying treating crews will be materially reduced.

It is obvious that the treating crews must be kept supplied with spray and it is believed that this can best be accomplished with a one-pack-animal unit assigned to each crew. The 20 gallons of spray carried by this animal will be sufficient to treat 8 or 10 trees, or what is estimated as being the daily output of a 3-man crew. Reserve caches will be maintained along the main trail, and in other areas where considered necessary. Sufficient pack stock must be made available to insure an adequate service of supply to all treating crews.

During the treating period of this project 16 pack animals will be required to transport oil to the treating crews. An additional string of 8 pack animals will be required to move the oil from the end of the truck road to the field caches. Saddle horses will not be necessary with the treating crew unit of one animal.

PERSONNEL REQUIREMENTS

| | |
|---|---|
| Work supervisors | 2 |
| Spotter checker | 1 |
| Chief spotters | 5 |
| Compassman | 5 |
| Spotters | 20 |

Treaters (16 crews of 3 men) . . . . . 48
(One of these men to act as crew leader and assume responsibility for proper treatment, direction of crew, etc. One man to care for the one-animal pack unit.)
Pack animals (for treating purposes only) . .24

SUMMARY OF EQUIPMENT

| | Spotting equipment | On hand | To be purchased |
|---|---|---|---|
| 5 | Standard F. S. compasses (staff) | X | |
| 5 | Jacob staffs | X | |
| 10 | Tally registers | X | |
| 6 | Tatum holders | X | |
| 35 | Spotters' axes with belt sheaths | X | |
| 3 boxes | Lumbermen's crayon | X | |
| 3,000 | Marking tags (white or yellow cloth 4" x 6") | | X |
| 100 | Map Sheets, Form #878 | X | |
| | Carbon Paper, red pencils, etc. | X | |

| | Treating equipment | | |
|---|---|---|---|
| 20 | Saws, 5½ foot | X | |
| 20 | Single jacks | X | |
| 40 | Felling wedges | X | |
| 20 | Axes, 3½#, D.B. | | X |
| 38 | Canthooks, 4½ foot handles | X | |
| 20 | Spray tanks | | X |
| | Gaskets, nozzles, etc. | | X |
| 10 | Pocket compasses for crew foremen | X | |

| | Transportation equipment | | |
|---|---|---|---|
| 120 | 5-gallon spray containers | | X |
| 55 | Pack boxes (see figure) | | X |
| 30 | Funnels (strainer), large | | X |

| | Spray Materials | | |
|---|---|---|---|
| 6,000 gallons | fuel oil, 27 + gravity (Baume) | | X |
| 1,500 gallons | orthodichlorobenzene | | X |

ESTIMATED COST OF PROJECT

| | | | | | | |
|---|---|---|---|---|---|---|
| **Camp Overhead** | | | | | | |
| 2 | Work supervisors (Camp Mgr.) | $150.00 (#12) | 35 days | $350.00 | | |
| 1 | Spotter checker | 135.00 (#11) | 21 days | 94.50 | | |
| 1 | Packer | 140.00 (# ) | 35 days | 163.33 | | |
| | | | | 607.83 | 607.83 | |
| **Spotting** | | | | | | |
| 5 | Chief spotters | $135.00 (#11) | 21 days | $472.50 | | |
| 5 | Compassmen | 120.00 (#10) | 21 days | 420.00 | | |
| 20 | Spotters | 120.00 (#10) | | 1,680.00 | | |
| | | | | 2,572.50 | 2,572.50 | |
| **Treating** | | | | | | |
| 16 | Working strawbosses | $0.60 per hour (#113) | 25 days | 1,930.00 | | |
| 32 | Workers | 0.50 per hour (#116) | 25 days | 3,220.00 | | |
| 2 | Saw filers | 120.00 (# ) | 25 days | 100.00 | | |
| | | | | 5,250.00 | 5,250.00 | |
| **Transportation** | | | | | | |
| | Camp equipment, $0.07 per mile, 4 loads | | | 50.00 | | |
| | Spray material, $0.07 per mile, 23 two-ton loads | | | 275.00 | | |
| | Truck driver $140.00 (#96) 30 days | | | 140.00 | | |
| | | | | 465.00 | 465.00 | |
| **Rent of Camp Equipment** | | | | | | |
| | 2 - 32-man camps at $300.00 each (estimated) | | | | 600.00 | |
| **Spray Materials** | | | | | | |
| | Fuel Oil, 6,000 gallons at $0.10 | | | 600.00 | | |
| | Orthodichlorobenzene, 1,500 gallons at $0.70 | | | 1,050.00 | | |
| | | | | 1,650.00 | 1,650.00 | |
| **Equipment** | | | | | | |
| 18 | spray tanks | | | 128.00 | | |
| | extra parts | | | 20.00 | | |
| 30 | funnels | | | 12.00 | | |
| 120 | 5-gallon containers at $0.50 | | | 60.00 | | |
| 55 | pack boxes at $2.00 (?) | | | 110.00 | | |
| | | | | 330.00 | 330.00 | |
| **Field Transportation of Spray Materials** | | | | | | |
| 8 | pack animals | $1.00 per head | 30 days | 240.00 | | |
| 16 | pack animals | 1.00 per head | 20 days | 320.00 | | |
| | | | | 560.00 | 560.00 | |
| | | | | | $12,035.33 | |
| | Annual leave and 1 holiday | | | | 1,039.00 | |
| | Shortage on subsistence deductions | | | | 200.00 | |
| | Estimated total for project | | | | $13,274.33 | |

## TRAINING OF PROJECT PERSONNEL

### Spotting Organization

The chief spotters, compassmen, and spotter-checker should all be available for at least one day's training while the first camp is being set up by the spotters. This training is considered as an essential phase of the project regardless of the previous experience of the men employed. Such training will provide an opportunity to clarify confusing points associated with the task of spotting and serve to standardize the work of all crews as well as impress upon those in charge the importance of the work that is to be performed. This training should consist of general lectures and field demonstration. Demonstration can be accomplished by organizing the crew leaders into a spotting crew.

### Treating Organization

Work supervisors must receive adequate instruction in the technique of applying the spray so that a proper coverage will be obtained with no waste of material. The importance of this training can hardly be overemphasized, as supervision is vital to the success of this project. Following this instruction the working strawbosses should be assembled for a day of actual instructions by the work supervisors and other overhead. Leaders should always be trained ahead of the men they are to supervise.